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# LAMARCK'S VIEWS ON THE EVOLUTION OF MAN, ON MORALS, AND ON THE RELATION OF SCIENCE TO RELIGION.

## I.

### LAMARCK'S VIEWS ON THE EVOLUTION OF MAN.

LAMARCK'S opinions on the origin of man are contained in his *Recherches sur l'organisation des corps vivans* (1802) and his *Philosophie zoologique*, published in 1809. We give the following literal translation in full of the views he presented in 1802, and which were probably first advanced in lectures to his classes.

“As to man, his origin, his peculiar nature, I have already stated in this book that I have not kept these subjects in view in making these observations. His extreme superiority over the other living creatures indicates that he is a privileged being who has in common with the animals only that which concerns animal life.

“In truth, we observe a sort of gradation in the intelligence of animals, like what exists in the gradual improvement of their organisation, and we remark that they have ideas, memory; that they think, choose, love, hate, that they are susceptible of jealousy, and that by different inflexions of their voice and by signs they communicate with and understand each other. It is not less evident that man alone is endowed with reason, and that on this account he is clearly distinguished from all the other productions of nature.

“However, were it not for the picture that so many celebrated men have drawn of the weakness and lack of human reason; were it not that, independently of all the freaks into which the passions

of man almost constantly allure him, the *ignorance* which makes him the opinionated slave of custom and the continual dupe of those who wish to deceive him ; were it not that his reason has led him into the most revolting errors, since we actually see him so debase himself as to worship animals, even the meanest, of addressing to them his prayers, and of imploring their aid ; were it not, I say, for these considerations, should we feel authorised to raise any doubts as to the excellence of this special light which is the attribute of man ?

“An observation which has for a long time struck me is that having remarked that the habitual use and exercise of an organ proportionally develops its size and functions, as the lack of employment weakens in the same proportion its power, and even more or less completely atrophies it ; I am apprised that of all the organs of man’s body which is the most strongly submitted to this influence, that is to say, in which the effects of exercise and of habitual use are the most considerable, is it not the organ of thought, in a word, is it not the brain of man ?

“Compare the extraordinary difference existing in the degree of intelligence of a man who rarely exercises his powers of thought, who has always been accustomed to see but a small number of things, only those related to his ordinary wants and to his limited desires ; who at no time thinks about these same objects, because he is obliged to occupy himself incessantly with providing for these same wants ; finally, who has few ideas, because his attention, continually fixed on the same things, makes him notice nothing, that he makes no comparisons, that he is in the very heart of nature without knowing it, that he looks upon it almost in the same way as do the beasts, and that all that surrounds him is nothing to him : compare, I say, the intelligence of this individual with that of the man who, prepared at the outset by education, has contracted the useful practice of exercising the organ of his thought in devoting himself to the study of the principal branches of knowledge ; who observes and compares everything he sees and which affects him ; who forgets himself in examining everything he can see, who insensibly accustoms himself to judge of everything for

himself, instead of giving a blind assent to the authority of others; finally, who, stimulated by reverses and especially by injustice, quietly rises by reflexion to the causes which have produced all that we observe both in nature and in human society; then you will appreciate how enormous is the difference between the intelligence of the two men in question.

“If Newton, Bacon, Montesquieu, Voltaire, and so many other men have done honor to the human species by the extent of their intelligence and their genius; how nearly does the mass of brutish, ignorant men approach the animal, becoming a prey to the most absurd prejudices and constantly enslaved by their habits, this mass forming the majority of all nations?

“Search deeply the facts in the comparison I have just made, you will see how in one part the organ which serves for acts of thought is perfected and acquires greater size and power, owing to sustained and varied exercise, especially if this exercise offers no more interruptions than are necessary to prevent the exhaustion of its powers; and on the other hand, you will perceive how the circumstances which prevent an individual from exercising this organ, or from exercising it habitually only while considering a small number of objects which are always of the same nature, impede the development of his intellectual faculties.

“After what I have just stated as to the results in man of a slight exercise of the organ by which he thinks, we shall not be more astonished to see that in the nations which have come to be the most distinguished, because there is among them a small number of men who have been able, by observation and reflexion, to create or advance the higher sciences, the multitude in these same nations have not been for all that exempted from the most absurd errors, and have not the less always been the dupe of imposters and victims of their prejudices.

“Such is in fact the fatality attached to the destiny of man that with the exception of a small number of individuals who live under favorable though special circumstances, the multitude forced to continually busy itself with providing for its needs, remains permanently deprived of the knowledge which it should acquire; in

general exercises to a very slight extent the organ of its intelligence; preserves and propagates a multitude of prejudices which enslave it, and cannot be as happy as those who, guiding it, are themselves guided by reason and justice.

“As to the animals, besides the fact that they in descending order have the brain less developed, they are otherwise proportionally more limited in the means of exercising and of varying their intellectual process. They each exercise them only on a single or on some special points, on which they become more or less expert according to their species. And while their degree of organisation remains the same and the nature of their needs (*besoins*) does not vary, they can never extend the scope of their intelligence, nor apply it to other objects than to those which are related to their ordinary needs.

“Some among them whose structure is a little more perfect than in others, have also greater means of varying and extending their intellectual faculties; but it is always within limits circumscribed by their necessities and habits.

“The power of habit which is found to be still so great in man, especially in one who has but slightly exercised the organ of his thought, is among animals almost insurmountable while their physical state remains the same. Nothing compels them to vary their powers, because they suffice for their wants and these require no change. Hence it is constantly the same objects which exercise their degree of intelligence, and it results that these actions are always the same in each species.

“The sole acts of variation, i. e., the only acts which rise above the limits of habits, and which we see performed in animals whose organisation allows them to, are *acts of imitation*. I only speak of actions which they perform voluntarily or freely (*actions qu'ils font de leur plein gré*).

“Birds, very limited in this respect in the powers which their structure furnishes, can only perform acts of imitation with their vocal organ; this organ by their habitual efforts to render the sounds, and to vary them, becomes in them very perfect. Thus

we know that several birds (the parrot, starling, raven, jay, magpie, canary bird, etc.) imitate the sounds they hear.

“The monkeys, which are, next to man, the animals by their structure having the best means to this end, are most excellent imitators, and there is no limit to the things they can mimic.

“In man, infants which are still of the age when simple ideas are formed on various subjects, and who think but little, forming no complex ideas, are also very good imitators of everything which they see or hear.

“But if each order of things in animals is dependent on the state of organisation occurring in each of them, which is not doubted, there is no occasion for thinking that in these same animals the order which is superior to all the others in organisation is proportionally so also in extent of means, invariability of actions, and consequently in intellectual powers.

“For example, in the mammals which are the most highly organised, the *Quadrumana*, which form a part of them, have besides the advantages over other mammals, a conformation in several of their organs, which considerably increases their powers, which allows of a great variability in their actions, and which extends and even makes predominant their intelligence enabling them to deal with a greater variety of objects with which to exercise their brain. It will doubtless be said: But although man may be a true mammal in his general structure, and although among the mammals the *Quadrumana* are most nearly allied to him, this will not be denied, not only that man is strongly distinguished from the *Quadrumana* by a great superiority of intelligence, but he is also very considerably so in several structural features which characterise him.

“First, the occipital foramen being situated entirely at the base of the cranium of man and not carried up behind, as in the other vertebrates, causes his head to be posed at the extremity of the vertebral column as on a pivot, not bowed down forward, his face not looking towards the ground. This position of the head of man, who can easily turn it to different sides, enables him to see better a larger number of objects at one time, than the much inclined position of the head of other mammals allow them to see.

“Secondly, the remarkable mobility of the fingers of the hand of man, which he employs either all together or several together, or each separately, according to his pleasure, and besides, the sense of touch highly developed at the extremity of these same fingers, enables him to judge of the nature of the bodies which surround him, to recognise them, to make use of them,—means which no other animals possess to such a degree.

“Thirdly, by the state of his organisation, man is able to hold himself up and walk erect. He has for this attitude which is natural to him, large muscles at the lower extremities which are adapted to this end, and it would thus be as difficult to walk habitually on his four extremities, as it would be for the other mammals and even for the *Quadrumana* to walk so habitually erect on the soles of their feet.

“Moreover, man is not truly quadrumanous; for he has not, like the monkeys, an almost equal facility in using the fingers of his feet, and of seizing objects with them. In the feet of man the thumbs are not in opposition to the other fingers to use in grasping, as in monkeys, etc., etc.

“I appreciate all these reasons, and I see that man, although near the *Quadrumana*, is so distinct that he alone represents a separate order, belonging to a single genus and species, offering however many different varieties. This order may be, if it is desired, that of the *Bimana*.

“However, if we consider that all the characteristics which have been cited are only differences in degree of structure, may we not suppose that this special condition of organisation of man *has been gradually acquired at the close of a long period of time, with the aid of circumstances which have proved favorable?*<sup>1</sup> What a subject for reflexion for those who have the courage to enter into it!

“If the *Quadrumana* have not the occipital opening situated directly at the base of the cranium as in man, it is assuredly much less raised posteriorly than in the dog, cat, and all the other mam-

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<sup>1</sup> Author's italics.

mals. Thus they all may quite often stand erect, although this attitude for them is very irksome.

"I have not observed the situation of the occipital opening of the jacko or orang-outang (*Simia satyrus* L.); but as I know that this animal almost habitually walks erect, though it has no strength in its legs, I suppose that the occipital foramen is not situated so far from the base of the skull as in the other *Quadrumana*.

"The head of the negro, less flattened in front than that of the European man, necessarily has the occipital foramen central.

"The more should the jacko contract the habit of walking about, the less mobility would he have in his toes, so that the thumbs of the feet which are already much shorter than the other digits, would gradually cease to be placed in opposition to the other toes, and to be useful in grasping. The muscles of its lower extremities would acquire proportionally greater thickness and strength. Then the increased or more frequent exercise of the fingers of its hands would develop nervous masses at their extremities, thus rendering the sense of touch more delicate. This is what our train of reasoning indicates from the consideration of a multitude of facts and observations which support it."<sup>1</sup>

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The subject is closed by a quotation from Grandpré on the habits of the chimpanzee. It is not of sufficient importance to be here reproduced.

Seven years after the publication of these series, Lamarck again returns to the subject in his *Philosophie zoologique*, which we translate.

*"Some Observations Relative to Man."*

"If man were distinguished from the animals by his structure alone, it would be easy to show that the structural characters which

<sup>1</sup> "How much this unclean beast resembles man!—*Ennius*."

"Indeed besides other resemblances the monkey has mammæ, a clitoris, nymphs, uterus, uvula, eye-lobes, nails, as in the human species; it also lacks a suspensory ligament of the neck. Is it not astonishing that man endowed with wisdom differs so little from such a disgusting animal!—*Linneæus*."



place him, with his varieties, in a family by himself, are all the product of former changes in his actions, and in the habits which he has adopted and which have become special to the individuals of his species.

“Indeed, if any race whatever of *Quadrumanus*, especially the most perfect, should lose by the necessity of circumstances or from any other cause, the habit of climbing trees, and of seizing the branches with the feet, as with the hands, to cling to them; and if the individuals of this race, during a series of generations, should be obliged to use their feet only in walking, and should cease to use their hands as feet; there is no doubt, from the observations made in the preceding chapter, that these *Quadrumanus* would be finally transformed into *Bimana*, and that the thumbs of their feet would cease to be shorter than the fingers, their feet only being of use for walking.

“Moreover, if the individuals of which I speak were impelled by the necessity of rising up and of looking far and wide, of endeavoring to stand erect, and of adopting this habit constantly from generation to generation; there is no doubt that their feet would gradually and imperceptibly assume a conformation adapted for an erect posture, that their legs would develop calves, and that these creatures would not afterwards walk as they do now, painfully on both hands and feet.

“Also, if these same individuals should cease using their jaws for biting in self-defence, tearing or seizing, or using them like nippers in cutting leaves for food, and should they only be used in chewing food; there is no doubt that their facial angle would become higher, that their muzzle would become shorter and shorter, and that in the end this being entirely effaced, their incisor teeth would become vertical.

“Now supposing that a race of *Quadrumanus*, as for example the most perfect, had acquired, by habits constant in every individual, the structure I have just described, and the power of standing erect and of walking upright, and that as the result of this it had come to dominate the other races of animals; we should then conceive:

“1. That this race farther advanced in its faculties, having arrived at the stage when it lords it over the others, will be spread over the surface of the globe in every suitable place;

“2. That it will hunt the other higher races of animals and will struggle with them for preëminence (*lui disputer les biens de la terre*) and that it will force them to take refuge in regions which it does not occupy;

“3. That being injured by the great multiplication of closely allied races and having banished them into forests or other desert places, it will arrest the progress of improvement in their faculties, while its own self, the ruler of the region over which it spreads, will increase in population without hindrance on the part of others, and, living in numerous tribes, will in succession create new needs which should stimulate industry and gradually render still more perfect its means and powers;

“4. That finally, this preëminent race having acquired an absolute supremacy over all the others, there arose between it and the highest animals a difference and indeed a considerable interval.

“Thus, the most perfect race of *Quadrumana* will have been enabled to become dominant, to change its habits as the result of the absolute dominion which it will have assumed over the others, and with its new needs; by progressively acquiring modifications in its structure and its new and numerous powers, to keep within due limits the most highly developed of the other races in the state to which they had advanced; and to create between it and these last very remarkable distinctions.

“The Angola orang (*Simia troglodytes* Lin.) is the highest animal; it is much more perfect than the orang of the Indies (*Simia satyrus* Lin.), which is called the orang-outang, and, nevertheless, as regards their structure they are both very inferior to man in bodily faculties and intelligence. These animals often stand erect; but this attitude is not habitual, their organisation not having been sufficiently modified, so that standing still (*station*) is painful for them.

“It is known, from the accounts of travellers, especially in regard to the orang of the Indies, that when immediate danger obliges

it to fly, it immediately falls on all fours. This betrays, they tell us, the true origin of this animal, since it is obliged to abandon the alien unaccustomed partially erect attitude which is thrust upon it.

“Without doubt this attitude is foreign to it, since in its change of locality, it makes less use of it, which shows that its organisation is less adapted to it ; but though it has become easier for man to stand up straight, is the erect posture wholly natural to him?

“Although man, who, by his habits, maintained in the individuals of his species during a great series of generations, can stand erect only while changing from one place to another, this attitude is not less in his case a condition of fatigue, during which he is able to maintain himself in an upright position only during a limited time and with the aid of the contraction of several of his muscles.

“If the vertebral column of the human body should form the axis of this body, and sustains the head in equilibrium, as also the other parts, the man standing would be in a state of rest. But who does not know that this is not so ; that the head is not articulated at its center of gravity ; that the chest and stomach, as also the viscera which these cavities contain, weigh heavily almost entirely on the anterior part of the vertebral column ; that the latter rests on an oblique base, etc. Also, as M. Richerand observes, there is needed in standing a force active and watching without ceasing to prevent the body from falling over, the weight and disposition of parts tending to make the body fall forward.

“After having developed the considerations regarding the standing posture of man, the same savant then expresses himself : ‘The relative weight of the head, of the thoracic and abdominal viscera, tends therefore to throw it in front of the line, according to which all the parts of the body bear down on the ground sustaining it ; a line which should be exactly perpendicular to this ground in order that the standing position may be perfect ; the following fact supports this assertion : I have observed that infants with a large head, the stomach protruding and the viscera loaded with fat, accustom themselves with difficulty to stand up straight, and it is not until the end of their second year that they dare to surrender them-

selves to their proper forces ; they stand subject to frequent falls and have a natural tendency to revert to the quadrupedal state.' (*Physiologie*, Vol. II., p. 268.)

"This disposition of the parts which cause the erect position of man, being a state of activity, and consequently fatiguing, instead of being a state of rest, would then betray in him an origin analogous to that of the mammals, if his organisation alone should be taken into consideration.

"Now in order to follow, in all its particulars, the hypothesis presented in the beginning of these observations, it is fitting to add the following considerations :

"The individuals of the dominant race previously mentioned, having taken possession of all the inhabitable places which were suitable for them, and having to a very considerable extent multiplied their necessities in proportion as the societies which they formed became more numerous, were able equally to increase their ideas, and consequently to feel the need of communicating them to their fellows. We conceive that there would arise the necessity of increasing and of varying in the same proportion the *signs* adopted for the communication of these ideas. It is then evident that the members of this race would have to make continual efforts, and to employ every possible means in these efforts, to create, multiply, and render sufficiently varied the *signs* which their ideas and their numerous wants would render necessary.

"It is not so with any other animals ; because, although the most perfect among them, such as the *Quadrumana*, live mostly in troupes, since the eminent supremacy of the race mentioned they have remained stationary as regards the improvement of their faculties, having been driven out from everywhere and banished to wild, desert, usually restricted regions, whither, miserable and restless, they are incessantly constrained to fly and hide themselves. In this situation these animals no longer contract new needs, they acquire no new ideas ; they have but a small number of them, and it is always the same ones which occupy their attention, and among these ideas there are very few which they have need of communicating to the other individuals of their species. There are, then,

only very few different *signs* which they employ among their fellows; also, some movements of the body or of certain of its parts, certain hisses and cries raised by the simple inflexions of the voice, suffice them.

“On the contrary, the individuals of the dominant race already mentioned, having had need of multiplying the *signs* for the rapid communication of their ideas, now become more and more numerous, and, no longer contented either with pantomimic signs or possible inflexions of their voice to represent this multitude of signs now become necessary, would succeed by different efforts in forming *articulated sounds*: at first they would use only a small number, conjointly with the inflexions of their voice; as the result they would multiply, vary, and perfect them, according to their increasing necessities, and according as they would be more accustomed to produce them. Indeed, the habitual exercise of their throat, their tongue, and their lips to make articulate sounds, will have eminently developed in them this faculty.

“Hence for this particular race the origin of the wonderful power of *speech*; and as the distance between the regions where the individuals composing it would be spread, would favor the corruption of the signs fitted to express each idea, from this arose the origin of languages, which must be everywhere diversified.

“Then in this respect necessities alone would have accomplished everything; they would give origin to efforts; and the organs fitted for the articulation of sounds would be developed by their habitual use.

“Such would be the reflexions which might be made if man, considered here as the preëminent race in question, were distinguished from the animals only by his physical characters, and if his origin were not different from theirs.”

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This is certainly, for the time it was written, an original, comprehensive, and bold attempt at explaining the probable origin of man from some arboreal creature allied to the apes. It is a more detailed and comprehensive hypothesis than that offered by Darwin in his *Descent of Man*, which Lamarck has anticipated. Darwin

does not refer to this theory of Lamarck and seems to have entirely overlooked it, as have others since his time. The change from an arboreal life and climbing posture to an erect one, and the transformation of the hinder pair of hands into the feet of the erect human animal, remind us of the very probable hypothesis of Mr. Herbert Spencer, as to the modification of the quadrumanon's posterior pair of hands to form the plantigrade feet of man.

## II.

### LAMARCK'S THOUGHTS ON MORALS, AND ON THE RELATION BETWEEN SCIENCE AND RELIGION.

One who has read the writings of the great French naturalist, who may be regarded as the founder of evolution, will readily realise that Lamarck's mind was essentially philosophic, comprehensive, and synthetic. He looked upon every problem in a large way. His breadth of view, his moral and intellectual strength, his equably developed nature, generous in its sympathies and aspiring in its tendencies, naturally led him to take a position as to the relations between science and religion, which, it goes without saying, is characteristic rather of the end than of the beginning of the nineteenth century.

When a very young man, he was for a time a friend of the erratic and gifted Rousseau, and was afterwards not unknown to Condorcet, the secretary of the French Academy of Sciences, so liberal in his views and so bitter an enemy of the Church; and though constantly in contact with the radical views and burning questions of that day, Lamarck throughout his life preserved his philosophic calm, and maintained his lofty tone and firm temper. We find no trace in his writings of sentiments other than the most elevated and inspiring, and we know that in character he was pure and sweet, self-sacrificing, self-denying, and free from self-assertion.

The quotations from his *Philosophie zoologique*, published in 1809, given below will show what were the results of his meditations on the relations between science and religion. Had his way of looking at this subject prevailed, how much 'misunderstanding

and ill-feeling between theologians and savants would have been avoided! Had his spirit and breadth of view animated both parties, there would not have been the constant and needless opposition on the part of the Church to the grand results of scientific discovery and philosophy, or too hasty dogmatism and scepticism on the part of the scientists.

In Lamarck, at the opening of the past century, we behold the spectacle of a man devoting over fifty years of his life to scientific research in biology, and insisting on the doctrine of spontaneous generation, of the immense length of geological time, so opposed to the views held by the Church, the evolution of plants and animals from a single germ, and even the origin of man from the apes, yet as earnestly claiming that nature has its Author who in the beginning established the order of things, giving the initial impulse to the laws of the universe.

As Duval says, after quoting the passage given below: "Deux faits son à noter dans ce passage: d'une part, les termes dignes et conciliants dans lesquels Lamarck établit la part de la science et de la religion; cela vaut, mieux, même en tenant compte des différences d'époques, que les abjurations de Buffon."<sup>1</sup>

The passage quoted by M. Duval is the following one:

"Surely nothing exists except by the will of the sublime Author of all things. But can we not assign him laws in the execution of his will, and determine the method which he has followed in this respect? Has not his infinite power enabled him to create an *order of things* which has successively given existence to all that we see, as well as to that which exists and that of which we have no knowledge? As regards the decrees of this infinite wisdom, I have confined myself to the limits of a simple observer of nature."<sup>2</sup>

In other places we find the following expressions:

"There is then, for the animals as for the plants, an order which belongs to nature, and which results, as also the objects

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<sup>1</sup> Mathias Duval. "Le transformiste français Lamarck." *Bulletin de la Société d'Anthropologie de Paris*, XII., 1889, p. 345.

<sup>2</sup> *Philosophie zoologique*, i. p. 56.

which this order makes exist, from the power which it has received from the SUPREME AUTHOR of all things. She is herself only the general and unchangeable order that this sublime Author has created throughout, and only the totality of the general and special laws to which this order is subject. By these means, whose use it continues without change, it has given and will perpetually give existence to its productions; it varies and renews them unceasingly, and thus everywhere preserves the whole order which is the result of it."<sup>1</sup>

"To regard nature as eternal, and consequently as having existed from all time, is to me an abstract idea, baseless, limitless, improbable, and not satisfactory to my reason. Being unable to know anything positive in this respect, and having no means of reasoning on this subject, I much prefer to think that *all nature* is only a result: hence I suppose, and I am glad to admit it, a first cause, in a word, a supreme power which has given existence to nature, and which has made it in all respects what it is."<sup>2</sup>

"Nature, that immense totality of different beings and bodies, in every part of which exists an eternal circle of movements and changes regulated by law; totality alone unchangeable, so long as it pleases its SUBLIME AUTHOR to cause its existence, should be regarded as a whole constituted by its parts, for a purpose which its Author alone knows, and not exclusively for any one of them.

"Each part is necessarily obliged to change, and to cease to be one in order to constitute another, with interests opposed to those of all; and if it has the power of reasoning it finds this whole imperfect. In reality, however, this whole is perfect and completely fulfils the end for which it was designed."<sup>3</sup>

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Lamarck's work on general philosophy was written near the end of his life, in 1820. He begins his *Discours préliminaire* by referring to the sudden loss of his eyesight, his work on the invertebrate animals being thereby interrupted. The book was, he says,

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<sup>1</sup>*Loc. cit.*, i. p. 113.

<sup>2</sup>*Loc. cit.*, i. p. 361.

<sup>3</sup>*Loc. cit.*, ii. p. 465.



“rapidly” dictated to his daughter, and the ease with which he dictated was due, he says, to his long-continued habit of meditating on the facts he had observed.

In the *Principes primordiaux* he considers man as the only being who has the power of observing nature, and the only one who has perceived the necessity of recognising a superior and only cause, creator of the order of the wonders of the world of life. By this he is led to raise his thoughts to the *supreme author* of all that exists.

“In the creation of his works, and especially those we can observe, this omnipotent Being has undoubtedly been the ruling power in pursuing the method which has pleased him, namely, his will has been :

“Either to create instantaneously and separately every particular living being observed by us, to personally care for and watch over them in all their changes, their movements, or their actions, to unremittingly care for each one separately, and by the exercise of his supreme will to regulate all their life ;

“Or to reduce his creations to a small number, and among these, to institute an order of things general and continuous, pervaded by ceaseless activity (*mouvement*), especially subject to laws by means of which all the organisms of whatever nature, all the changes they undergo, all the peculiarities they present, and all the phenomena that many of them exhibit, may be produced.

“In regard to these two modes of execution, if observation taught us nothing we could not form any opinion which would be well grounded. But it is not so ; we distinctly see that there exists an order of things truly created (*véritablement créé*), as unchangeable as its author allows, acting on matter alone, and which possesses the power of producing all visible beings, of executing all the changes, all the modifications, even the extinctions, so also the renewals or re-creations that we observe among them. It is to this order of things that we have given the name of *nature*. The supreme author of all that exists is, then, the immediate creator of matter as also of nature, but he is only indirectly the creator of what nature can produce.

“The end that God has proposed to himself in creating matter, which forms the basis of all bodies, and nature, which divides (*divise*) this matter, forms the bodies, makes them vary, modifies them, changes them, and renews them in different ways, can be easily known to us; for the Supreme Being cannot meet with any obstacle to his will in the execution of his works; the general results of these works are necessarily the object he had in view. Thus this end could be no other than the existence of nature, of which matter alone forms the sphere, and should not be that causing the creation of any special being.

“Do we find in the two objects created, i. e., *matter* and *nature*, the source of the good and evil which have almost always been thought to exist in the events of this world? To this question I shall answer that good and evil are only relative to particular objects, that they never affect by their temporary existence, the general result expected (*prévu*), and that for the end which the Creator designed, there is in reality neither good nor evil, because everything in nature perfectly fulfils its object.

“Has God limited his creations to the existence of only matter and nature? This question is vain, and should remain without an answer on our part; because, being reduced to knowing anything only through observation, and to bodies alone, also to what concerns them, these being for us the only observable objects, it would be rash to affirm affirmatively or negatively on this subject.

“What is a spiritual being? It is what, with the aid of the imagination, one would naturally suppose (*l'on vaudra supposer*). Indeed, it is only by means of opposing that which is material that we can form the idea of spirit; but as this hypothetical being is not in the category of objects which it is possible for us to observe, we do not know how to take cognisance of it. The idea that we have of it is absolutely without base.

“We only know physical objects and only objects relative to these beings (*êtres*): such is the condition of our nature. If our thoughts, our reasonings, our principles, have been considered as metaphysical objects, these objects, then, are not beings (*êtres*).

They are only relations or consequences of relations (*rapports*), or only results of observed laws.

“We know that relations are distinguished as general and special. Among these last are regarded those of nature, form, dimension, solidity, size, quantity, resemblance, and difference; and if we add to these objects the beings observed and the consideration of known laws, as also that of conventional objects, we shall have all the materials on which our thoughts are based.

“Thus being able to observe only the phenomena of nature, as well as the laws which regulate these phenomena, also the products of these last, in a word, only bodies (*corps*) and what concerns them, all that which immediately proceeds from supreme power is incomprehensible to us, as it itself [i. e., supreme power] is to our minds. To create, or to make anything out of nothing, this is an idea we cannot conceive of, for the reason that in all that we can know, we do not find any model which represents it. God alone, then, can create, while nature can only produce. We must suppose that, in his creations, the Divinity is not restricted to the use of any time, while on the other hand nature can effect nothing without the aid of long periods of time.”

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Without translating more of this remarkable book, which is very rare, much less known than his *Philosophie zoologique*, the spirit of the remainder may be imagined from the foregoing extracts.

The author refers to the numerous evils resulting from ignorance, false knowledge, lack of judgment, abuse of power, demonstrating the necessity of our confining ourselves within the circle of the objects presented by nature, and never to go beyond them if we do not wish to fall into error, because the profound study of nature and of the organisation of man alone, and the exact observation of facts alone, will reveal to us “the truths most important for us to know,” in order to avoid the vexations, the perfidies, the injustices, and the oppressions of all sorts, and “incalculable disorders” which arise in the social body. In this way only shall we discover and acquire the means of obtaining the enjoyment of the

advantages which we have a right to expect from our state of civilisation. The author endeavors to state what science can and should render to society. He dwells on the sources from which man has drawn the knowledge which he possesses, and from which he can obtain many others,—sources the totality of which constitutes for him the field of realities.

Lamarck also in this work has built up a system for moral philosophy.

Self-love, he says, perfectly regulated gives rise :

1. To moral force which characterises the laborious man, so that the length and difficulties of a useful work do not repel him ;
2. To the courage of him who, knowing the danger, exposes himself when he sees that this would be useful.
3. To love of wisdom.

Wisdom, according to Lamarck, consists in the observance of a certain number of rules or virtues. These we cite in a slightly abridged form.

Love of truth in all things ; the need of improving one's mind ; moderation in desires ; decorum in all actions ; a wise reserve in unessential wants ; indulgence, toleration, humanity, good will towards all men ; love of the public good and of all that is necessary to our fellows ; contempt for weakness ; a kind of severity towards oneself which preserves us from that multitude of artificial wants enslaving those who give up to them ; resignation, and if possible, moral impassibility in suffering reverses, injustices, oppression, and losses ; respect for order, for public institutions, civil authorities, laws, morality, and religion.

The practice of these maxims and virtues, says Lamarck, characterises true philosophy.

And it may be added that no one practised these virtues more than Lamarck. Like Cuvier's, his life was blameless, and though he lived a most retired life, and was not called upon to fill any public station other than his chair of zoölogy at the Jardin des Plantes, we may feel sure that he had the qualities of courage, independence, and patriotism which would have rendered such a career most useful to his country.

As Bourguin eloquently asserts : “Lamarck was the brave man who never deserted a dangerous post, the laborious man who never hesitated to meet any difficulty, the investigating spirit, firm in his convictions, tolerant of the opinions of others, the simple man, moderate in all things, the enemy of weakness, devoted to the public good, imperturbable under the attainments of fortune, of suffering, and of unjust and passionate attacks.”

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